



# COMPUTER GRAPHICS

**benson-lehner corporation**

VOL. 2 NO. 7

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## UNIQUE MICROFILM PRINTER / PLOTTER

Benson-Lehner Corporation announces the **MICROMATIC II**, the first and only second generation CRT microfilm printer-plotter on the market today.

The **MICROMATIC II** is a true modular system, completely solid state, and features the latest in high reliability silicon logic circuits.

As the first completely off-line CRT microfilm printer-plotter, the **MICROMATIC II** features a complete system and does not rely on costly computer tape transports as have previous systems.

Through-put on the **MICROMATIC II** is a high 7200 frames per hour for both 556 and 800 bpi tapes. The transfer of data direct from the **MICROMATIC II** tape unit offers increased flexibility and freedom from transfer problems, enabling tapes prepared on a variety of transports to be received as input with no adjustments required. The **MICROMATIC II** is compatible with all 7-track, 1/2-inch magnetic tapes as well as the recently introduced 9-track, 1/2-inch magnetic tape.

The unique Benson-Lehner character generating scheme utilized in the **MICROMATIC II** provides the sharpest and clearest printing available. Sixty-four characters designed for easy reading are furnished as standard; however, for special applications, additional characters of the customers design may be added as an optional feature. Two distinct character sizes with either vertical or horizontal orientation are program controlled.

A Hard Copy Camera, provided with the **MICROMATIC II** as optional, produces output copy directly. A "quick look" copy may be obtained within seconds. Hard copy exposure is performed at the same rate as microfilm and may be utilized simultaneously. For report type quality, the microfilm may be processed utilizing

B - L  
ANNOUNCES  
CRT MICROFILM  
PRINTER / PLOTTER  
MICROMATIC II

This is an actual output of the **MICROMATIC II** character generator, enlarged 2x.

standard microfilm processing techniques.

Due to the increased demand for high volume printing, the **MICROMATIC II** offers the computer user increased flexibility. The Printer Formatting option will allow tapes prepared for the **MICROMATIC II** to be printed on the 1401/1403 or other computer printers without format modifications. This feature can also be tailored to the other major computer manufacturers' printer formats.

Cost? The total system including the optional line drawing feature, Hard Copy Camera, and Printer Formatting compatibility is less than \$130,000. For a personal demonstration of the **MICROMATIC II**, contact Benson-Lehner Corporation.



14761 CALIFA STREET / VAN NUYS, CALIFORNIA / 781-7100



## B-L Data Reduction System Speeds Up Turnaround time for Film Data Analysis

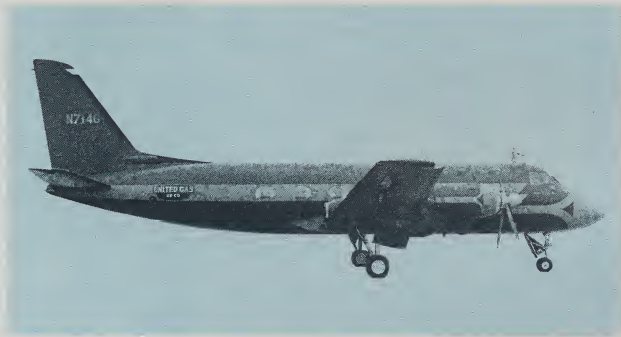
Flight test data from the Grumman Gulfstream I is being rapidly reduced at Grumman's Bethpage, Long Island facilities. The high-speed, semi-automatic data reduction center includes a Benson-Lehner BOSCAR S film reading system used in conjunction with the Benson-Lehner Magnetic Tape Electroplotter II.

On a recent Gulfstream test project, raw film data was analyzed and reduced by the BOSCAR S to IBM card output at a rate in excess of 4000 frames per day. The IBM cards were then converted to magnetic tape for input to the Magnetic Tape Electroplotter II. Utilizing the complete editing and search capabilities of the Electroplotter II, turnaround time for 23,000 raw data points for the time history study was reduced to less than six hours.

According to Erik Holmgren, head of the Semi-Automatic Data Processing Group, "The Benson-Lehner semi-automatic data reduction system has proven to be very economical as well as providing extremely speedy turnaround time for film data analysis."

The editing and search features of the Magnetic Tape Electroplotter II were particularly suited for the comprehensive final reports that Grumman requires on all Gulfstream test projects.

This application of Benson-Lehner data reduction equipment is particularly interesting due to the fact that United Gas Corporation, Benson-Lehner's parent company, utilizes a Grumman Gulfstream in conjunction with its gas transmission services.



United Gas Corporation's twin-engine Grumman Gulfstream (shown above) is typical of the aircraft presently being used at Grumman to accumulate test data.



Erik Holmgren (center), shown with members of his technical staff, reviews flight analysis data from the Grumman Gulfstream.

## IFIP CONGRESS 65 EXHIBITION

A "first peek" public display of the recently introduced Benson-Lehner LTE Magnetic Tape, Solid State Plotting System and the DRAFTOMATIC 305 Magnetic Tape Plotting System will be exhibited at the coming IFIP Congress Exhibition, INTERDATA 65, sponsored by the International Federation for Information Processing, which will be showing at the New York Hilton Hotel from May 24 through 27, 1965.

Benson-Lehner data reduction equipment will be demonstrated at Booths 147 and 148 during the conference. More than 5,000 participants from some fifty countries are expected to converge on the New York Hilton to see and hear about the latest in information processing techniques and equipment.

If you are planning to attend the show, be sure to see the latest computer-graphic equipment from Benson-Lehner.

## NEW CATALOG

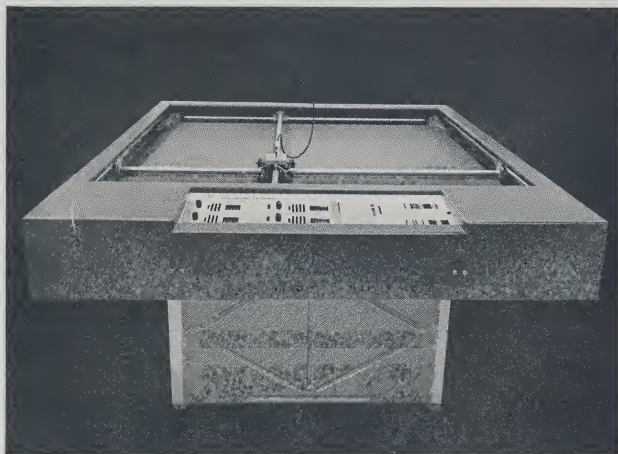
A new *Quick Reference File* catalog will be available next month. This 8-page QRF will contain descriptions and photographs of B-L's complete line of data reduction and digital plotting equipment.



## Geophysical Firm Plots Seismic Recordings

Houston, Texas — Ray Geophysical Division, Mandrel Industries, Inc., one of the leading geophysical firms serving the nation and overseas, is utilizing two Benson-Lehner LTE Magnetic Tape Plotting Systems in connection with their geophysical studies of seismic recordings, autocorrelogram and power spectrum analysis curves, contour gravity maps, spotting and contouring seismic time maps, and the plotting of both synthetic and actual seismic sections. This diverse plotting and contouring program is particularly suited to the capabilities of the Benson-Lehner LTE Magnetic Tape Plotting System.

Autocorrelogram and power spectrum analysis curves are plotted on the LTE for analysis purposes and to help in establishing parameters to be used when applying various dereverberation operators. Normally one plotting of the analysis curve for each seismic record is sufficient; however, in particular instances, numerous analyses must be run for each record to establish final parameters.



**Large Table Electroplotter (LTE)**

Both times and depths gained from seismic surveys are spotted on contour maps. The large plotting area of the LTE is suited to this purpose. The contour program from the Benson-Lehner Program Library has aided Ray Geophysical in generating computer tapes for contouring plots on the LTE. Contours may be drawn with two different pens, allowing various contours to be drawn in different widths or colors. Highs and lows, with their values, may be spotted on the map, and contour values may be printed on the contour lines. In addition, various degrees of smoothing can be applied to contour lines.

Due to the large plotting area of the LTE, synthetic seismograms from computer generated tapes are plotted in close proximity to actual seismograms. This technique permits Ray Geophysical Division to compare various techniques, both in research and production, whereby theoretical results can be compared with results on actual sections. Moreover, this allows a more detailed presentation of seismic sections. In addition to evaluating theoretical techniques and to help in interpretation of the actual seismograms, the large plotting area of the LTE allows large cross sections containing many seismic records to be drawn. Computer generated tapes for the LTE are recorded at 800 bits per inch, with records several thousand words in length. These tapes are then read on a spe-

cial transport, built by Ampex for Ray Geophysical Division, through a 4K memory and are then transferred to the plotter at plotting rates.

At present, two Benson-Lehner LTE Systems are being used in these applications. One LTE System is located in Houston, Texas, and the other is located in London, England, with both doing the same complement of work.

## NEW INSTALLATIONS

### Offutt Air Force Base

Omaha, Nebraska  
Magnetic Tape LTE Plotter

### Ray Geophysical

London, England  
Magnetic Tape LTE Plotter

### Ray Geophysical

Houston, Texas  
LTE Plotter

### Dow Chemical

Houston, Texas  
Incremental Plotter Model 305

### Grumman Aircraft Engineering Corporation

Bethpage, New York  
Magnetic Tape Electroplotter II

### E. S. Preston and Associates

Dayton, Ohio  
Incremental Plotter Model 305

### U. S. Naval Supply Center

Oakland, California  
Incremental Plotter Model 110

### Lawrence Radiation Laboratory

Livermore, California  
Incremental Plotter Model 110

### Florida State University

Tallahassee, Florida  
Oscar Model S-2, Projector Model A

### Los Alamos Scientific Laboratory

Los Alamos, New Mexico  
Oscar Model S-2, Projector Model S

### Roland F. Beers, Inc.

Alexandria, Virginia  
Magnetic Tape Converter II

### Rocket Power, Inc.

Mesa, Arizona  
Oscar Model F, Decimal Converter Model F,  
Electrotyper Model C

### Mc Master University

Hamilton, Ontario, Canada  
Oscar Model K

### University of Michigan

Ann Arbor, Michigan  
Decimal Converter Model F

### Edgerton, Germeshausen and Grier, Inc.

Las Vegas, Nevada  
Rollafold Model B

### Pratt and Whitney Aircraft

Hartford, Connecticut  
Rollafold Model B

### Corps of Engineers

Galveston, Texas  
Oscar Model K

### Yale University

New Haven, Connecticut  
Oscar Model F, Decimal Converter Model F,  
Projector Model A

**COMMENTS BY DR. HESS ON THE  
FLORIDA STATE UNIVERSITY OSCAR S-2:**

1. I am the Machine which have brought thee out of the land of Measurement by Caliper; out of the house of bondage to paper and pencil. Thou shalt have no other machines before me.
2. Thou shalt not make unto thee any graven cards nor any likeness of my Nixie displays.
3. Thou shalt not take the name of Benson-Lehner in vain.
4. Remember the seventh day to rest the projection lamp and ease the burden of all transistors.
5. Honor thy NASA and thy ONR that thy support may be long upon the land which thy overhead encompasseth.
6. Thou shalt not kill accuracy by failing to minimize parallax error or by any other sloppy operation.
7. Be faithful to thy patchboard program and commit not adultery with other boards.
8. Thou shalt not steal opportunities to punch buttons or twiddle dials when thou hast not been trained in My operation.
9. Thou shalt not bear false witness by failing to set X and Y to zero at the appointed place on each frame.
10. Thou shalt not covet the machines of the particle physicist, neither his Itek nor his Hermes, nor anything that his huge budget permitteth.

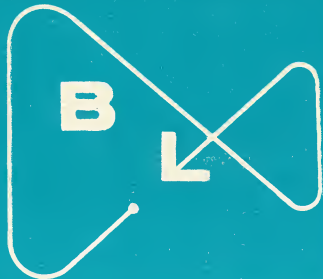
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**BENSON LEHNER CORPORATION**

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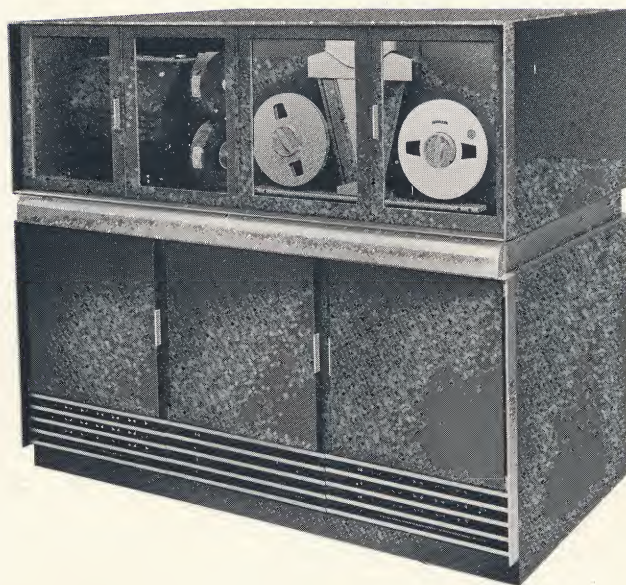




# benson-lehner corporation

## B-L 120

### T E C H N I C A L   D A T A   S H E E T



**The B-L 120** — the **FIRST** second-generation CRT microfilm printer/plotter on the market today — is a truly expandable, modular system, completely solid-state, and features the latest in high reliability silicon logic circuits.

As the first completely off-line CRT microfilm printer/plotter, the B-L 120 features a complete system and does not rely on costly computer tape transports as have previous systems. The transfer of data is direct from the B-L 120 tape unit offering increased flexibility and freedom from transfer problems. Tapes may be prepared on a variety of computer transports and used as input to the B-L 120.

The unique second-generation character generating circuitry utilized in the B-L 120 provides the sharpest and clearest printing available. Sixty-four characters designed for easy reading are furnished as standard and may be displayed in two character sizes with both horizontal or vertical orientation program controlled.

With all features under program control, the B-L 120 may be used to construct completed graphs, including curves, axes, scales, legends, and title blocks, on microfilm or on hard copy at true computer rates. The hard copy printer provides immediate (within four seconds) "quick look" copies of the microfilm as it is written. The auxiliary forms projector exposes a pre-printed form onto the film and hard copy on command.

The B-L 120 offers the computer user an economical system with increased flexibility for high-speed computer output, test instrumentation, data analysis, critical path displays, numeric control verification, automatic drafting, and circuit board design.

## FEATURING . . .

- Compatible program language
- DATAMEC D 2020 — 556 and 800 bpi — tape transport
- Vector and axes line drawing
- Silicon solid-state modular construction
- Program controlled character size and orientation
- Minimum thru-put of 120 frames per minute
- 64 characters — may be customer designed



**benson-lehner**

# B-L 120

## OFF-LINE MICROFILM PRINTER/PLOTTER

### STANDARD FEATURES

<b>off-line:</b>	Includes Datomec D 2020 tape transport reducing transfer problems and does not require costly computer tape transports.
<b>vector lines:</b>	Vector lines may be drawn from any point to any point and may have lengths up to 64 adjacent plotting positions.
<b>axes lines:</b>	Straight lines in either axis may be drawn from a specified origin to the top or sides of the plotting area.
<b>64 characters:</b>	64 characters designed for easy reading are furnished in two distinct sizes: NORMAL and LARGE.
<b>character orientation:</b>	Program controlled vertical or horizontal orientation is possible with both character sizes.
<b>35mm film:</b>	Magazine fed 35mm film in continuous rolls up to four-hundred feet.
<b>printing format:</b>	128 characters to the line and 64 lines to the page.
<b>thru-put:</b>	120 full printing-format frames per minute.
<b>resolution:</b>	1024 (X) by 1024 (Y) plotting matrix.
<b>accuracy:</b>	0.75 % of full scale.
<b>drift:</b>	Less than $\pm 0.02\%$ in a ten-second interval.
<b>character registration:</b>	Within 5 % of the character height (for both normal and large characters).

### PHYSICAL SPECIFICATIONS

<b>size:</b>	61" high x 69" wide x 39" deep.
<b>weight:</b>	Approximately 1700 pounds (Forms Projector, 100 pounds; Hard Copy Camera, 125 pounds).
<b>power:</b>	208/120 $\pm 5\%$ AC, 60 cycle, three phase (WYE connected), four wire, 2000 watts.
<b>environment:</b>	+60 F. to 85 F. (10 % to 80 % relative humidity).
<b>circuits:</b>	Completely solid state, modular, featuring the latest in high reliability silicon logic circuits.

### OPTIONAL FEATURES

<b>hard copy camera:</b>	Provides "quick look" copy directly on 9-inch paper within 4-seconds after exposure. Integrally mounted developer allows "quick look" copy simultaneously with microfilm exposure.
<b>forms projector:</b>	Exposes prepared optical slide onto microfilm and/or hard copy under program control. Registration of form to CRT display is 0.25 % of full scale.
<b>frame butting:</b>	Program-controlled precision film advance allows butting consecutive data frames to form one continuous long chart.
<b>printer formatting:</b>	Allows prepared tapes to be printed on 1401/1403 or other computer printers without format modifications. This feature may be tailored to the other major computer manufacturers' printer formats.
<b>64 additional characters:</b>	Additional characters of the customer's design may be added.
<b>9-track tape:</b>	May be adapted to handle IBM compatible 9-track, 1/2-inch magnetic tape.
<b>16mm:</b>	Magazine fed 16mm monochromatic film in continuous rolls up to four-hundred feet (in lieu of 35mm camera).

### PROGRAMMING SUPPORT

Program requirements for the B-L 120 are compatible with existing printer/plotters. Housekeeping routines for most computers as well as many special purpose programs and/or routines are available upon request for customer usage from our programming library. On-site support and programming assistance is also available from Benson-Lehner.

### WARRANTY

90 days from date of acceptance at customer's facility.

*This specification subject to change without notice.*

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